

**CLAIMS**

1. Flat thermionic emission screen (1) comprising  
a first substrate (2) on which are arranged an  
emission cathode (4) and an electron extraction grid  
(8), a second substrate (12) facing the first substrate  
(2), on which is arranged an anode (14) designed to  
collect the electrons emitted by the cathode(4), and an  
electronic control circuit (19) of the anode voltage  
(14) comprising at least one commutation component  
(18,20), characterized in that the commutation  
component (18,20) is integrated through design in the  
first substrate (2) and in the second substrate (12) of  
the screen (1).

15 2. Screen according to claim 1, characterized in  
that the said commutation component (18,20) is an HV  
transistor with a first electrode (40, 50) integrated  
in the first substrate(2), a second electrode (42,52)  
integrated in the second substrate (12) and a third  
20 electrode (44,54) integrated in the extraction grid  
(8).

25 3. Screen according to claim 1, characterized in  
that the anode (14) constitutes the emissive surface of  
the screen (1) and comprises at least one conducting  
surface (15) on which phosphor materials (17) are  
deposited.

30 4. Screen according to claim 2, characterized in  
that the cathode(4) comprises conducting columns (32)  
with sources of electrons (6), and in that the grid (8)  
comprises perforated conducting lines crossing the said

conducting lines at the positions of the said sources (6).

5. Screen according to claim 4, characterized in that the cathode (4) is a microtip source.

5 6. Screen according to claim 4, characterized in that the cathode (2) is a nanotube source.

7. Screen according to one of claims 1 to 6, characterized in that the electronic circuit (19) is of the push-pull type and comprises furthermore a second 10 transistor (20) with a first electrode (50) integrated in the first substrate (2), a second electrode (52) integrated in the second substrate (12) and connected electrically to the first electrode (50) of the first transistor (18), and a third control electrode (54) 15 integrated in the extraction grid (8) of the screen (1).

8. Screen according to one of claims 1 to 7, characterized in that it comprises furthermore a logical control module (100) comprising a low voltage 20 source Vdd (24) and an optoelectronic coupler (26).

9. Screen according to claim 8, characterized in that the logical control module (100) comprises a load pump galvanically insulated from the screen (1) by a capacitor C.

25 10. Transistor, characterized in that it comprises a first semi-conducting substrate (80) on which are arranged a first electrode (40) and a control grid (44), a second substrate (86) facing the first substrate (80) and on which is arranged a second electrode (42) designed to collect the electrons 30 emitted by the first electrode (40).

**11.** Transistor according to claim 10,  
characterized in that the first electrode (40)  
comprises microtips (6) arranged in lines and columns,  
the control grid (44) comprises perforated conducting  
lines crossing the columns of the first electrode (40)  
at the positions of the said microtips (6), the second  
electrode (42) comprises at least one conducting  
surface facing the said microtips (6).

**Figure 3**

HV	Red anode voltage	Time
5		
HV	Green anode voltage	Time
HV	Blue anode voltage	Time

10 **Figure 4**

HV	Anode voltage	Image time	Time
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15 **Figure 5**

v1	Image time	Time
v2	Image time	Time

20 **Figure 9**

Ianode	V(grid-cathode) <sub>3</sub>	
	V(grid-cathode) <sub>2</sub>	
	V(grid-cathode) <sub>1</sub>	
	V(grid-cathode) <sub>0</sub>	
25	V(grid-cathode) <sub>SAT</sub>	V(Anode-cathode)